

HUMAN RESOURCE PLANNING AND DEVELOPMENT FOR AUTOMATED LIBRARY AND INFORMATION SYSTEMS

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1 INTRODUCTION

Automated Library and Information System (ALIS) is a System (ALIS) which utilises computers, telecommunication technology and the methods and devices provided by current information technology for its functioning. While computers are used for library housekeeping and information processing, retrieval and dissemination; telecommunication technology is used for accessing the remotely located databases for which also computers are the most essential requirement. Only a computerised library system can harness the possibilities offered by modern information technology.¹ ALIS is mainly a computerised system.

11 THE MACHINES

Among the electronic machines invented by man computer has made a greater impact in society than any other single devices. They have extended man's powers in information processing to regions that could not be previously dreamed of.

A computer system consists of three basic elements; hardware, software and humanware. The electronic and electro-mechanical equipments including CPU, primary storage units, peripheral devices such as terminals, printers, disk drives and tape drives are called hardware. The software is the intelligence of the computer system. It is a set of programmes which control the activities of the computer system or which may be processed that is run on computer to do some useful work.

12 HUMAN ELEMENT

Computer is only an extension of the human brain's function of data processing and its manipulation by machines. So human beings are the most important component of the Computer system. Many machine interface is so vital that usually the human component of the system is termed as humanware.

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Staff of ALIS mediate between information and information seekers. Their work is becoming increasingly complex with the developments in information technology. The success of an ALIS is dependent to a large extent on the knowledge, skills and attitudes of its staff, since they are the people whom users meet and it is their version of the system's objectives and their user orientation or lack of it that is apparent to users in everyday climate of the library.²

So it is the skills of the human beings that go to make for a successful ALIS. And the measure of their ability in designing, programming and planning is the measure of the success of ALIS. Hence the first and most important requirement for establishing or changing to an ALIS is the availability of qualified and experienced staff. Not only for operating the system but also during the stages of actively specifying, designing, programming, testing and installing an ALIS qualified and experienced staff are clearly needed.

13 FUNCTIONS OF ALIS

In an ALIS the works for which computers are used can be classified into two categories.³

- (i) library housekeeping and information services.
- (ii) library management information services.

The first category consists of works like acquisition, serial control, circulation, cataloguing and information services like CAS and SDI. The second category is the works related to processing of information which the library management requires to control Library operations, make decisions and maintain statistics which would help the management to evaluate user behaviour and library's performance. This would enable the library management to observe the total system clearly, control it and correct deviations if any.

Automation would have a significant impact on the rest of the library structurally. When computer takes over; some functions will disappear, some will be simplified to meet new requirements, some required to run ALIS will be introduced, some will be altered and the integration of certain functions to serve or to use the new system will also take place. For ALIS to be efficient the computers should be an integral part of the library system accessible to library management, controlled by it and run by competent work group.

2 MANPOWER PLANNING

Qualification and skill of the existing staff of library and information

systems who followed traditional and manual methods will not be sufficient for ALIS which has to use highly advanced technologies.⁴ So training the existing manpower or recruiting new professionals will become essential.

Organizing function of an ALIS would involve grouping of work into logical and efficient levels and divisions and grouping of work teams into units meant for them order to carry out plans and achieve goals. If the work units are to be effective each unit member must know what his job includes and where he stands in the hierarchy and should have the technical knowledge to fulfil the duties of that position.⁵

The composition of ALIS depends on the tasks and jobs which takes place in the system; the scope and magnitude of data processing work which must be performed and the extent to which this work is carried out by it.

ALIS would require staff with qualification and experience in the application of computer and telecommunication technologies. They should also have knowledge, skills and abilities in librarianship. Individuals with knowledge of both aspects are rare. So usually the twin skills can be obtained only from two or more persons.

3 COMPOSITION OF ALIS

Computer installations meant for ALIS vary considerably in size and the way in which they operate. The works in an ALIS and the staff required for types and levels of work are discussed below. Depending upon the size of ALIS and its operation it may employ some or all the personnel mentioned below. Universities and Resource Sharing Networks like INFLIBNET will require all the levels and categories of staff. A college library or small research institute need only employ a staff of the second level at first and can make use of the computer consultancy services for all non repeating specialized jobs.

The works in an ALIS can be grouped into the following levels and divisions for assessing manpower requirement.

31 OVERALL MANAGEMENT

ALIS is a project; very large and complex. It involves intricately detailed activities that need to be efficiently organised and controlled. Since the work of computer system will be related to the rest of the library, without cooperative effort the project cannot be a success. There should be Head for ALIS. He as manager of the system should have knowledge of where and how best to employ computer in the various operating divisions. His duties would include long term planning, organizing, coordinating, controlling,

motivating and innovating to achieve effective ALIS. He has to forecast manpower requirements, monitor the quality of work, evaluate the efficiency of the sub systems and the effectiveness of the whole ALIS.

The Head of ALIS must be able to act as a means of communication between the library staff and the computer professionals who will design the computer systems, write and test programmes. He must be able to speak both languages. He must be sufficiently mature and must possess a broad knowledge and understanding of library's aims, objectives and methods to command the respect from other divisions and ensure the co-operation of all staff. His task will be to determine library's requirements expressed in librarians vocabulary to fix necessary quantitative measures, of the systems in question, and to translate them into requirements for the computer system in computing terms.

32 SYSTEM DEVELOPMENT

System development work is based on the functional division of analysis and programming. There should be a senior staff to manage system development. Under him will work staff meant for systems analysis and programming.

321 *System Analysis*

The staff who does system analysis has to study the existing system which is to be computerised. He has to study the problems to be solved and prepare solutions and programme specifications. He has to determine what processes should go on, volume of data to be processed, time of processing the data and the feed-back from the users. One librarian from each section of the library will have to assist him in system analysis. The activities of system analyst includes analysis, design and project leading.

On the basis of the analysis of the existing system, the system analyst would design a computer based system. The design will cover four main parts of the system; the programmes, the inputs, the files and outputs. After the system has been implemented the systems development manager will review the project and the working of the system to ascertain whether the objectives have been achieved or not. This will help systems development manager in future project planning.

322 *Programming*

Computer programmes are to be prepare on the basis of the specifications prepared by system analyst. The staff who supervises programming assisted by computer programmers will define the logic of the system which would be tested by putting test data through the executing programme. The

programming function is sometimes further divided into preparation of new application and maintenance of existing programmes. The staff who supervises programming will be responsible for keeping the programmes running throughout their operational life by removing errors, amending the existing ones, and developing yet another for new application.

33 COMPUTER OPERATIONS

In ALIS it should be ensured that the devices work perfectly and are used efficiently. The staff who manages computer operations should possess knowledge of internal working of the entire system. He has to ensure that the devices under his control remain functional. He will be responsible to the Head of ALIS for this. His duties are to control, plan and organize the complete output of information and the use of all equipments of ALIS. These operations will be carried out by a work team consisting of four staff members looking after computer operations, data preparation, files and maintenance of hardware.

331 *Machine Operations*

There will be a staff responsible for actual operations of the machines from start to shut down time. He feeds the messages to the operating system through console typewriter. Much of the work however consists of loading and unloading magnetic tapes, discs, and computer stationery. He will also be responsible for environmental control such as temperature and humidity. He will also maintain records of batches processed, timings and error reports.

332 *Data Preparation*

Accurate and timely conversion of data from various source documents into computer input media is essential in ALIS. The staff should be entrusted with the responsibility for this work. The source documents will be submitted from various sections of the library according to predetermined time table. This staff will report faults in the equipments to the maintenance engineer and maintain record of machine availability. The staff who manages computer operations takes appropriate action if the situation is unsatisfactory.

333 *File Maintenance*

File Librarian will be responsible for keeping safely all computer files. At the time of their operational use file librarian will have to locate them and issue them for the staff who undertakes machine operations. File librarian will maintain a catalogue of all the files and in some cases duplicate files also.

334 Hardware Maintenance

Hardware items of ALIS require maintenance and continuous servicing. The maintenance engineer performs preventive maintenance and routine repairs of the equipments. He will also help in further expansion of the ALIS by adding new devices, auxiliary memory, etc.

The important question in regard to the hardware engineers is whether or not they should be employed as library's own staff. If the planned programme for automation is a combination of more than one or two very simple systems the ALIS will need the full time services of maintenance engineer. But if the ALIS is only a part of an institute or industrial firm which has its own computer division the engineers from that division can be made use of.

34 MANPOWER REQUIREMENT

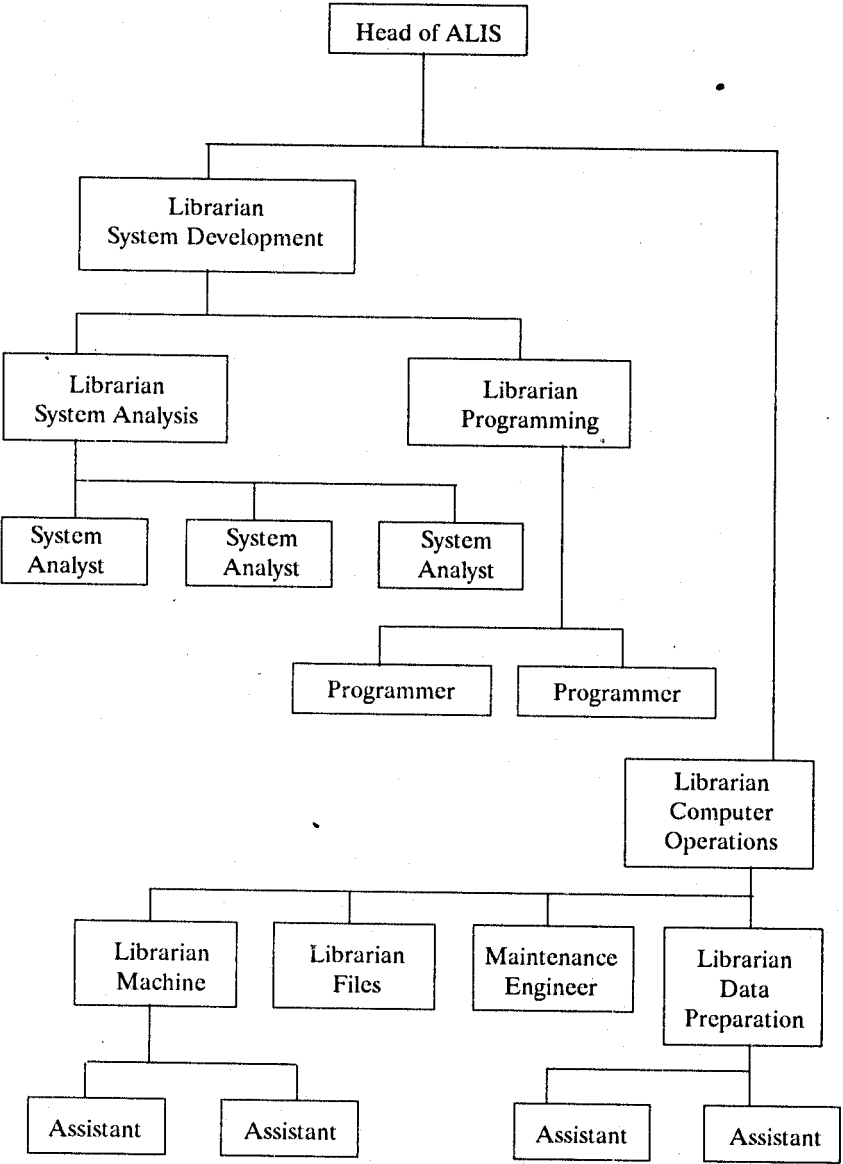
At the topmost level ALIS will require a person to head the system. In University Libraries the University Librarian or a staff equivalent to his grade specially meant for ALIS should manage the system. At the second level there should be two senior staff to manage system development and computer operations. Under them will come the third level of staff meant for the subsystem of ALIS. The same is explained in the Figure 1.

4 MANPOWER DEVELOPMENT

While offering infinite possibilities for information access ALIS has simultaneously made librarian's work much more technical and complex than ever before. No longer is it possible however to leave these aspects entirely to computer specialists. In order to profitably exploit the versatile capabilities of computers and telecommunication technology it is essential for the librarians to have a good understanding of these technologies, so that specific tasks in a library and information centre in which these could be applied can be identified.⁶

Although computer professionals may not have an appreciation or understanding of the various jobs involved in the running of a library and information centre, once the library and information worker identifies the task to be achieved, the computer professional will find it relatively easy to implement the job and to achieve the final objective. Without a broad understanding of the capabilities of computers the library and information worker will not be able to identify and define the scope of jobs which computers can be made to do.

It is in the above context that one has to realise the need to give due prominence to a general grounding in the computer technology to library



Staff Structure of ALIS
Fig. 1

and information science students. The purpose of the course has to be to inculcate computer literacy. Neither is it possible nor is it necessary to develop high level expertise in computer science or computer programming among library and information science students. The expertise has to be of such level as to permit the library manager or information scientist, to intelligently interact with computer scientists in order to explain the job the computer scientist has to do for the library and information science worker.⁸

41 EDUCATION AND TRAINING

It is clear from what we discussed above that in order to successfully apply computers to library and information work it would be essential to give first priority to education and training of manpower. It is the man at the job who matters. If we succeed in giving excellent education and training to existing library professionals and potential professionals then our information systems will be efficient.⁹ So there is an important and pertinent question. Are our library science departments of universities and colleges able to provide to the students the education and training that would enable them to cope up with the needs of present computerised library and information systems?

42 LIBRARY SCIENCE COURSES

Library and Information Science courses of many of the Indian Universities have not yet included computer application in their syllabi. The papers some universities are offering on computer science as part of BLISc or MLISc course are inadequate or obsolete in the changed context of present computerised library and information service environment.

Hence the curriculum content of library and information science courses of all our universities require thorough revision and also replacement of some papers on traditional methods by computer application and other aspects of present information technology. The UGC should also set up a Curriculum Development Centre for Library and Information Science similar to the ones already set up by UGC for other disciplines.

43 INFORMATION TECHNOLOGY

Computer basics with programming, and networking, online information systems, computerised library housekeeping and information retrieval should be included in two or three papers at BLISc and MLISc level. At Master's Degree level courses specializing on computer application or modern information technology can be started. The following should be the objectives of such courses.

- * to expose library professionals to computer applications and other aspects of current information technology.
- * to enable the professionals to evaluate, select and install microcomputer system in libraries.
- * to develop the ability of the professionals to design, evaluate and implement various softwares.
- * to strengthen the self-confidence of the professionals to make them attain proper status in society.

5 REDESIGNING SYLLABUS

BLISc and MLISc syllabi should be totally redesigned to include application of Information Technology. Existing syllabi for application of computer and telecommunication technology of Information Technology in general at Bachelor's and Master's degree levels should be reviewed and redesigned, to include theory and practicals on the following aspects:

51 COMPUTER SCIENCE

- * History of computers—computer generations—classification of computers—basic principles of operation of digital computers—comparison of mini, micro and mainframe computers.
- * Hardware components—central processing unit, Memory, Arithmetic Logic unit, control unit—secondary storage devices—Input/output devices—personal computers—selection of hardware.
- * Data processing concepts—computer codes and arithmetic.
- * Software components—types—machine languages—high level languages—compilers, interpreters and operating systems—Pascal—CDS/ISIS.
- * Systems analysis and programming—Feasibility study—criteria for system selection—programming analysis—preparing computer programme—flow charting.

52 COMMUNICATION TECHNOLOGY

- * Tele-communications and Networks—possibilities for information flow.
- * Communication media—dial-up phone lines—analogue leased lines—digital leased lines—digital dial-up lines—coaxial cables—microwave communication—satellite communications—fibre optics communication—laser communication.
- Data communication—point to point versus multipoint networks—half duplex versus full duplex transmission—asynchronous versus synchronous communications—timing modes.

- Modems—multiplexers and concentrators—front end processors.
- * Terminals for data communications—CRT displays—Teletype terminals—RJE line printers—facsimile transmission units—character printers—word processing systems—portable terminals—personal computers—point of sale terminals—hand held terminal.
- * Networks—types—Local Area networks—high speed, medium speed low speed PBX networks.
- * Video text—display, access and input—terminal—telecommunication link—view data bases—links to other information systems.

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- * Information online—vendor types—vendor support services—selection of vendors—databases—search process—equipments and communication software.
- * Information storage and retrieval systems—structure of records—files and databases—formulation of search strategies.
- * Computerised library house keeping—acquisition processes—serials control—cataloguing—circulation—classification and inter library loan systems.

6 EXISTING STUDY FACILITIES

Of the library and information science courses conducted in India INSDOC, DRTC and a few of the central universities like Banaras Hindu University and Delhi University have covered satisfactorily the above aspects of Information Technology in their course curriculum.

61 DRTC

In DRTC computer application to library and information work is taught intensively in their Associateship in Documentation and Information Science Course. The courses cover the following topics.

- * Systems analysis and programming.
- * Pascal and Cobol languages
- * Automated library housekeeping
- * Computerised information retrieval
- * Use of CDS/ISIS package.

During the course students get well acquainted with the use of computers and they use computers for their dissertation work. DRTC also conducts one short term course on computer application to library and information activities which is sponsored by NISSAT.

DRTC has the required hardware and software systems to be exclusively used for teaching and research activities. Those systems were acquired for the DRTC-NISSAT project on training manpower developmental programme.

62 REFRESHER COURSES

At present most of the personnel working in our university, college, special and research libraries lack computer knowledge. They should be helped to develop their computer knowledge and skill in view of proposed computerisation and networking projects to be introduced in Indian library environment. For improving the skill of these working librarians and teachers in library science, continuing education programme should be started. Summer schools, refresher courses and inservice training on computer application to library and information work should be conducted in all universities and library schools.

63 EXISTING TRAINING PROGRAMMES

A number of training programmes and workshops are regularly conducted for manpower development in library field under NISSAT to fulfil the above objectives.¹⁰ These courses are conducted from various national, sectoral and regional centres such as INSDOC, DRTC, DESIDOC, SIE, CSIR, and BARC. Apart from these a number of training courses and workshops are also being conducted under NISSAT sponsorship. INSDOC conducts the following training programmes regularly under the sponsorship of NISSAT.

- * Computer Application to Library and Information Activities. A five-week course for freshers.
- * DBMS and dBase with particular reference to application in library and information activities. Four-week duration.
- * CDS/ISIS version 2.32 with Pascal interface for those having exposure to CDS/ISIS version 1.0. Four-week course.
- * Bibliometrics. Two-week course.
- * Recent developments in Information Science and Technology. Two week course.
- * Two-year full time course leading to Associateship in Information Science.

7 MANPOWER SELECTION

Availability of the right kind of manpower in appropriate measure and quality at various levels is essential if any meaningful achievements are to be expected from automation. So manpower planning and selection is an issue of growing significance. In order to automate our university, college, and special libraries and to enable them to play their role efficiently and

effectively we need adequate and highly skilled manpower. There are two aspects for library manpower.

- * manpower required to run ALIS.
- * manpower required for the library schools that could train library and information workers required for ALIS.

71 PARA PROFESSIONAL FIELDS

Medical professions has by now recognised many para professional fields and has delegated many duties which it performed earlier to those fields. Like that library and information science field also should be able to delegate specialised technical works related to ALIS to concerned fields and control them. Libraries, library systems and networks should recruit computer hardware, software and telecommunication engineers to handle the concerned work. At least one post of lecturer with Master's Degree in Computer Application and experience in that field should be created in every library science school.

8 STATUS AND POSITION

The efficiency and effectiveness of the ALIS would depend on the competence of the staff. The availability of competent staff will depend on the status of the position and the facilities and environment provided for their work and development. So allowing higher pay scales and fixing sufficient qualifications and norms for recruitment of personnel are essential to maintain quality of ALIS. The following categories of pay scales and qualifications are suggested for staff of ALIS and teachers who are to educate these staff.

<i>Designation</i>	<i>Scale of Pay</i>	<i>Qualification and Experience</i>
Head of ALIS	4500-7300	MLISC/MCA Doctorate or published work of high standard. 10 years experience in managing computerised library systems.
Librarian for System Development	3700-5700	MLISC/MCA Doctorate or published work of high standard. 10 years experience.
<i>Designation</i>	<i>Scale of Pay</i>	<i>Qualification and Experience</i>
Librarian for managing computer operations	3700-5700	Do
Librarian System Analysis	3000-5000	MLISC/MCA 8 years experience on concerned work.

Librarian Programming	3000-5000	Do
Librarian	3000-5000	Do
Machine Operations		
Librarian	3000-5000	Do
Data Preparation		
Librarian (Files)	3000-5000	Do
Computer Programmer	2200-4000	MCA and five years experience.
System Analyst	2200-4000	Do
Maintenance Engineer	3000-5000	M.Tech in Computer Science and five years experience.
Lecturer	3000-5000	MCA, Doctorate or published work of high standard. Eight years teaching experience.
Computer Operations		

9 CONCLUSION

Human aspects are all pervasive and play a vital role at all stages of the development of ALIS and its operations. So investment in manpower development is to be regarded as the most significant element in ALIS. In this fast changing environment the library and information workers are required to possess enhanced managerial, professional and technical skills, adequate knowledge and right kind of experience. The manpower should be so competent and trained that they can anticipate changes and respond to them, seize opportunities at the right time and take initiative whenever necessary. They must possess flexibility of attitude, imagination and scientific bend of mind.

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